



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/004.191	10/31/2001	Roland M. Hochmuth	10017760-1	5760

7590 08/02/2004
HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER

CHAUHAN, ULKA J

ART UNIT	PAPER NUMBER
----------	--------------

2676

DATE MAILED: 08/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/004,191

Applicant(s)

HOCHMUTH ET AL.

Examiner

Ulka J. Chauhan

Art Unit

2676

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7/11/02</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1-3 and 6-9 are rejected under 35 U.S.C. 102(b) as being anticipated by B. Schmidt, M. Lam, and J. Northcutt. The Interactive Performance of SLIM: A Stateless, Thin-Client Architecture. In *Proceedings of the Seventeenth ACM Symposium on Operating Systems Principles*. Vol. 33 Issue 5, December 1999, pgs. 32-47 (Schmidt).**
3. As per claim 1, Schmidt teaches a thin-client architecture comprising: a display network interface operable to receive graphics image data of an image over a communication network; a display frame buffer operable to store said received graphics image data; and a display refresh unit operable to read said stored graphics image data from said display frame buffer, said display refresh unit further operable to display said image on a display unit (*a thin-client architecture in which raw display updates are transmitted over a network to display devices [pg. 34 sec. 2.1]; The display consoles of the architecture receive display primitives, decode them, and send the pixels to the graphics controller [pg. 35 sec. 2.3]; The consoles comprise a network interface, frame buffer, and peripheral I/O [pg. 34 sec. 2.1 and pg. 35 sec. 2.3]*).
4. As per claim 2, Schmidt discloses a display network interface port coupled to said display network interface, said graphics image data being received over said communication network via said display network interface port (*consoles coupled to the interconnection fabric implicitly*

Art Unit: 2676

teaches network interface port, and consoles receiving 2D pixels over the interconnection fabric [Fig. 1]).

5. As per claim 3, Schmidt discloses that the display network interface port is selected from the group consisting of an Ethernet port, an Infiniband port, and a wireless network transceiver (*10/100 Base-T Ethernet connection [pg 34 sec. 2.1]*).

6. As per claim 6, Schmidt discloses graphics image data being part of a plurality of packets received from a remote source device (*UDP/IP transmission between servers and consoles [pg. 35 sec. 2.2.]*).

7. As per claims 7 and 8, Schmidt discloses wherein said remote source device is a graphics adapter or a graphics appliance (*In the SLIM architecture, all processing is performed on a set of server machines [pg. 35 sec. 2.4]; executing real-time applications such as video or 3D-rendered games [pg. 44 sec. 7]*).

8. Claim 9 is similar in scope to claim 1 and is rejected under the same rationale.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 4, 5, 10, 11, and 13-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over B. Schmidt, M. Lam, and J. Northcutt. The Interactive Performance of SLIM: A Stateless, Thin-Client Architecture. In *Proceedings of the Seventeenth ACM Symposium on Operating Systems Principles*. Vol. 33 Issue 5, December 1999, pgs. 32-47 (Schmidt) and U.S. Patent No. 5,974,471 to Belt.

12. As per claims 4 and 5, Schmidt does not expressly teach a display decompression unit operable to decompress said graphics image data into decompressed graphics image data. Belt teaches a computer system with distributed compression and decompression wherein the network interface controller 124 includes codec logic 172 [Fig. 1]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the distributed compression and decompression in the form of codec 172 within Schmidt's consoles in order to decompress received data that is transmitted in compressed form for conserving transmission bandwidth.

13. Claims 10, 11, 13, 15, 16, 18, 19, and 20 are similar in scope to claims 1-7, and are rejected under the same rationale.

14. As per claims 14 and 21, Schmidt does not expressly teach decompression being performed at a rate at least as fast as a rate at which said image is being displayed on said display unit. Belt discloses that the distributed compression and decompression logic for compressed data movement improves efficiency for data transfers and increases the performance of real-time

Art Unit: 2676

applications [c. 2 ll. 40-47]. Therefore, Belt implicitly teaches that decompression rate at least equal to the display rate.

15. As per claim 17, Schmidt does not expressly teach that the network interface port comprises an Infiniband port. As is well known, Infiniband is an I/O interface that merges the work of NGIO (Next Generation I/O) and Future I/O. As the demands for high bandwidth and low latency in computer technology increases, the emerging InfiniBand architecture is being developed by the information industry. InfiniBand architecture de-couples an I/O subsystem from memory by utilizing point-to-point connections rather than a shared bus. InfiniBand products are ideally suited for clustering, I/O extension, and native attachment in many network applications and can be used in high-performance server applications, providing a cost-effective transition from existing technologies. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have implemented an Infiniband port in Schmidt's architecture in order to take advantage of greater bandwidth and expandability of the Infiniband port.

16. As per claim 22, Schmidt teaches a display consoles [Fig. 1]. Computer systems such as a typical desktop personal computer (PC) or workstation generally use a display monitor such as a cathode ray tube (CRT) or Liquid Crystal Display (LCD).

17. **Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over B. Schmidt, M. Lam, and J. Northcutt. The Interactive Performance of SLIM: A Stateless, Thin-Client Architecture. In *Proceedings of the Seventeenth ACM Symposium on Operating Systems Principles*. Vol. 33 Issue 5, December 1999, pgs. 32-47 (Schmidt) and U.S. Patent No. 5,974,471 to Belt and U.S. Patent No. 5,936,616 to Torborg, Jr. et al.**

18. As per claim 12, Schmidt does not expressly teach graphics image data and said decompressed graphics image data being store in different portions of said display frame buffer. Torborg teaches a display controller that maintains a shared memory 142 comprising both a decompressed cache (VFB cache) used to store a decompressed portion of the frame buffer, and compressed memory used to store compressed subregions of the frame buffer [Fig. 6 and c. 9 ll. 39-43]. The invention provides the advantages of reducing memory requirements in computer display architectures because the display image is stored in compressed form, and reducing the memory bandwidth required to access the display image since it requires less bandwidth to transfer compressed data as opposed to decompressed data [c. 3 ll. 14-22]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have implemented the console frame buffer as comprising both compressed portion and decompressed portion as taught by Torborg in order to conserve storage and reduce memory bandwidth as taught by Torborg.

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

G. Humphreys and P. Hanrahan. A Distributed Graphics System for Large Tiled Displays. In *Proceedings of the Conference on Visualization '99*. October 1999, pp 215-223.

G. Humphreys, M. Eldridge, I. Buck, G. Stoll, M. Everett, and P. Hanrahan. WireGL: A Scalable Graphics System for Clusters. In *Proceedings of the 28th Annual Conference on Computer Graphics and Interactive Techniques*. August 2001, pp 129-140.

G. Stoll, M. Eldridge, D. Patterson, A. Webb, S. Berman, R. Levy, C. Claywood, M. Taveira, S. Hunt, and P. Hanrahan. Lightning-2: A High-Performance Display Subsystem for PC Clusters. In *Proceedings of the 28th Annual Conference on Computer Graphics and Interactive Techniques*. August 2001, pp 141-148.

U.S. Patent Application Publication No. 2003/0017846 to Estevez et al

U.S. Patent Application Publication No. 2002/0196378 to Slobodin et al

U.S. Patent Application Publication No. 2002/0174254 to Kita et al

U.S. Patent No. 6366289 to Johns U.S. Patent No. 6166734 to Nahi et al

U.S. Patent No. 6075523 to Simmers U.S. Patent No. 5485570 to Bushboom et al

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ulka J. Chauhan whose telephone number is (703) 305-9651.

The examiner can normally be reached on Mon. through Fri., 9:30 a.m. to 4:00 p.m.

21. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on (703) 308-6829. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

22. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ulka J. Chauhan
Primary Examiner
Art Unit 2676

ujc
July 26, 2004